PROPOSED RULE AMENDMENT SUMMARY
SUPPORTING INFORMATION
AND THE PROPOSED
STANDARDS OF QUALITY FOR WATERS OF THE STATE

Introduction

The Clean Water Act (CWA) specifically §303(c) (1) requires states to modify and improve their water quality standards at least once every three years. During the triennial review the State of North Dakota is required to review, modify and adopt as appropriate applicable new scientific and technical information into its Standards of Quality for Waters of the State of North Dakota (Standards) taking into consideration public concerns and EPA guidance. The Clean Water Act requires states to adopt EPA's recommended criteria or adopt their own to ensure consistency with the requirements of the Act.

The state's last triennial review of the Standards began in 2013, was adopted by the Health Council on February 11, 2014, propagated as rule on April1, 2014, and received EPA approval without condition on August 14, 2014. The current review began with a meeting of the North Dakota Pollution Control Board on October 27, 2015.

Standards of Quality for Waters of the State of North Dakota (Standards)

The Standards consist of the following three basic elements. All three of these elements are being reviewed to improve formatting issues as well as to reflect the most current scientific and technical information.

1. Designated Uses: The designated use describes the existing and/or potential use of the water body. Examples of some designated uses are municipal water supply (after treatment), propagation of aquatic life, water-based recreation, irrigation, and stock watering.

2. Water Quality Criteria: Numeric criteria are established for specific pollutants. If the concentration of a pollutant exceeds the numeric criterion, a designated use is not being maintained. Narrative and general requirements are also included in the Standards. These are referred to as "free form" and include substances, such as garbage, dead animals, oil, scum and materials that produce odors, and substances that render undesirable taste to fish flesh.

3. Antidegradation Policy: This State policy was established to protect, maintain, and improve the water quality necessary for all existing and designated uses.

Summary of Proposed Changes to the Standards

1. Designated Uses: No Changes

2. Water Quality Criteria: (1) Added two new definitions on page 3. The first new definition defines nutrients and second defines eutrophication; (2) On page 3 & 4 added compliance schedules as a tool for achieving standards for permitted dischargers; (3) Added a new narrative "free from" criteria on page 6 for nutrients; (4) Redesigned the numeric standards text and tables on page 7 through page 23 for improved brevity and clarity. In brief, the redesign includes removing the sulfate, chloride, pH, for Class I through III streams in text format and placing them into Table 1 on page 11-14, building a new Table 2 that separates compounds from elements and

lists both alphabetically; (5) Added a column to Table 1 that identifies the beneficial use being supported by the criteria; (6) To clearly define how the criteria are applied to wetlands, temporary and marginal lakes on page 8 added: f. wetlands, including isolated ponds, class 4 lakes not listed in Appendix II, sloughs, and marshes. The physical and chemical criteria shall be those for class III stream in Table 1 and 2, and narrative 33-16-02.1-08; (7) Also on page 8, added (listed in Appendix II) to the end of the first sentence under lakes and reservoirs; (8) In the Appendix II description on page 29 added (and other waterbodies) to those not listed; (9) on page 14 in Table 2 remove the chemical compound delta-BHC (Hexachlorocyclone Hexane-Delta) as no acute, chronic or human health value is available; (10) Updated the CAS No for diquat on page 15 in Table 2 from 85-00-7 to 2764-72-9; (11) updated aquatic life chronic and acute criteria for cadmium to 1.8 and 0.72 µg/L, respectively, to reflect the most current scientific data; (12) Updated the Human Health Criteria to match the 2015 EPA ambient water quality criteria for the protection of Human Health for all priority pollutants and the five select non priority pollutants, Barium, Chlorophenoxy Hebicide (2-4-D), Methoxychlor, Nitrates, and pH .

Detail of Proposed Changes to the Standards

Water Quality Criteria: (1)

1. **33-16-02.1 STANDARDS OF QUALITY FOR THE WATERS OF THE STATE**

   Page 1:

Variances and Compliance Schedules

2. **33-16-02.1-04 Definitions**

   Page 3:

11. "Nutrients". Nutrients are defined as chemical elements, primarily nitrogen and phosphorus, which are critical to the growth of aquatic plants and animals.

12. "Eutrophication". Eutrophication is defined as the process of enrichment of rivers, stream, lakes, reservoirs and wetlands with nutrients needed to maintain primary production.

3. **33-16-02.1-05 Variances**

   Page 3:

Variances and Compliance Schedules

   Pages 3 & 4:

A North Dakota Pollution Discharge Elimination Systems (NDPDES) permit may contain a schedule of compliance leading to the return of a permittee into compliance with federal and state regulation(s). Compliance schedules in NDPDES permits are subject to the requirements of N.D.A.C. 33-16-01-15 and cannot be issued for new discharges or sources.

4. 33-16-02.1-08 General water quality standards

Page 5:

a. Narrative Standards

(6) Free from nutrients attributed to municipal, industrial, or other discharges or agricultural practice, in concentration or loadings which will cause accelerated eutrophication resulting in the objectionable growth of aquatic vegetation or algae or other impairment to the extent that threatens public health or welfare or impairs present or future beneficial uses.

5. 33-16-02.1-09. Surface water classifications, mixing zones, and numeric standards:

Page 7-21:

3. Numeric standards.

a. Class I streams. ~~Unless stated otherwise, m~~ Maximum limits, characteristics and criteria for class I streams are listed in table 1 and table 2.

b. Class IA streams. The physical and chemical criteria shall be those for class I streams, with the ~~following~~ exceptions for chloride, percent sodium and sulfate as listed in table 1.

c. Site Specific Sulfate Standard. The physical and chemical criteria for the Sheyenne River from its headwaters to one-tenth of a mile downstream from Baldhill Dam shall be those for a class AI streams with the exception of sulfate as listed in table 1.

~~Substance or Characteristic ..... Maximum Limit~~

~~Chlorides (total) ..... 175 mg/l (30-day arithmetic average)~~

~~Sodium ..... 60% of total cations as mEq/l~~

~~Sulfate (total) ..... 450 mg/l (30-day arithmetic average)~~

~~Site-Specific Sulfate (total) Standard~~

~~The following site-specific standard applies to the Sheyenne River from its headwaters to one-tenth mile downstream from Baldhill Dam.~~

~~Sulfate (total) ..... 750 mg/l~~

~~131.10(b) requirement~~

~~The water quality standards for the Red River and the portions of the Sheyenne River located downstream from the segment of the Sheyenne River to which the site-specific sulfate standard applies must continue to be maintained. The Sheyenne River from 0.1 mile downstream from Baldhill Dam to the confluence with the Red River shall not exceed 450 mg/l sulfate (total) 30-day arithmetic average and the Red River shall not exceed~~

~~250 mg/l sulfate (total 30-day arithmetic average after mixing, downstream from the confluence of the Sheyenne River. Regulated pollution control efforts must be developed to achieve compliance with these water quality standards.~~

d. Class II streams. The physical and chemical criteria shall be those for class IA, with the ~~following~~ exceptions for chloride and pH as listed in table 1:

~~Substance or Characteristic~~	~~Maximum Limit~~
~~Chlorides (total)~~	~~250 mg/l (30-day arithmetic average)~~
~~pH~~	~~6.0-9.0 (up to 10% of representative samples collected during any 3-year period may exceed this range provided that lethal conditions are avoided)~~

e. Class III streams. The physical and chemical criteria shall be those for class II, with the ~~following~~ exceptions for sulfate as listed in Table 1:

~~Substance or Characteristic~~	~~Maximum Limit~~
~~Sulfate (total)~~	~~750 mg/l (30-day arithmetic average)~~

f. Wetlands, including isolated ponds, class 4 lakes not listed in Appendix II, sloughs, and marshes. The physical and chemical criteria shall be those for class III stream in table 1 and 3, and narratives in 33-16-02.1-08.

~~e~~g. Lakes and reservoirs.

(1) The beneficial uses and parameter limitations designated for class I streams shall apply to all classified lakes or reservoirs listed in Appendix II. However, specific background studies and information may require that the department revise a standard for any specific parameter.

~~TABLE 1~~

~~MAXIMUM LIMITS FOR SUBSTANCES IN OR HARACTERISTICSOF CLASS I STREAMS~~

~~CASE[1] No.~~	~~Substance or Characteristic~~	~~Maximum Limit~~
		~~Acute Standard~~
~~7429905~~	~~Aluminum~~	~~750 ug/l~~
		~~Chronic Standard~~
		~~87 ug/l Where the pH is equal to or greater than 7.0, and the hardness~~

is equal to or greater than 50 mg/l as $CaCO_3$ in the receiving water after mixing, the 87 ug/l chronic total recoverable aluminum criterion will not apply, and aluminum will be regulated based on compliance with the 750 ug/l acute total recoverable aluminum criterion.

Acute Standard

7446-41-7 Ammonia (Total as N)

The one-hour average concentration of total ammonia (expressed as N in mg/l) does not exceed, more often than once every three years on the average, the numerical value given by the following formula:

$$\frac{0.411}{1+10^{7.204-pH}}+\frac{58.4}{1+10^{pH-7.204}},$$

where salmonids are absent; or

$$\frac{0.275}{1+10^{7.204-pH}}+\frac{39.0}{1+10^{pH-7.204}},$$

where salmonids are present.

Chronic Standard

The 30-day average concentration of total ammonia (expressed as N in mg/l) does not exceed, more often than once every three years on the average, the numerical value given by the following formula; and the highest 4-day average concentration of total ammonia within the 30-day averaging period does not exceed

2.5 times the numerical value given by the following formula:

$$=(0.0577+2.487)\bullet \text{Criteria Variable (CV)};$$
$$\left(\frac{}{1+10^{7.688-pH}}+\frac{}{1+10^{pH-7.688}}\right)$$

where CV = 2.85, when T ≤ 14° C; or

$CV = 1.45 \times 10^{0.028(25-T)}$, when T > 14° C.

Site-Specific Chronic Standard

The following site-specific standard applies to the Red River of the North beginning at the 12th Avenue North bridge in Fargo, North Dakota, and extending approximately 32 miles downstream to its confluence with the Buffalo River, Minnesota. This site-specific

standard applies only during the months of October, November, December, January, and February. During the months of March through September, the statewide chronic ammonia standard applies.

The 30-day average concentration of total ammonia (expressed as N in mg/l) does not exceed, more often than once every three years on the average, the numerical value given by the following formula; and the highest 4-day average concentration of total ammonia within the 30-day averaging period does not exceed
2.5 times the numerical value given by the following formula:

$$= \frac{(0.0577+2.487)}{\left(1+10^{7.688-pH}\right)} * \frac{CV;}{1+10^{pH-7.688}}$$

where CV = 4.63, when T ≤ 7° C; or

$CV = 1.45 \times 10^{0.028 \cdot (25-T)}$, when T > 7° C.

7440-39-3	Barium (Total)	1.0 mg/l (one-day arithmetic average) Boron (Total) .75 mg/l (30-day arithmetic average)
16887-00-6	Chlorides (Total)	100 mg/l (30-day arithmetic average)
7782-50-5	Chlorine Residual (Total)	Acute .019 mg/l Chronic .011 mg/l
7782-44-7	Dissolved Oxygen	5 mg/l as a daily minimum (up to 10% of representative samples collected during any 3-year period may be less than this value provided that lethal conditions are avoided)
	E. coli[3]	Not to exceed 126 organisms per 100 ml as a geometric mean of representative samples collected during any 30-day consecutive period, nor shall more than 10 percent of samples collected during any 30-day consecutive period individually exceed 409 organisms per 100 ml. For assessment purposes, the 30-day consecutive period shall follow the calendar month. This standard shall apply only during the recreation season May 1 to September 30.
14797-55-8	Nitrates (N) (Diss.)[2]	1.0 mg/l (up to 10% of samples may exceed)
	pH	7.0-9.0 (up to 10% of representative samples collected during any three-year period may exceed this range, provided that lethal conditions are avoided)
108-95-2		Phenols (Total) 0.3 mg/l (organoleptic criterion) (one-day arithmetic average)
	Sodium	50 percent of total cations as mEq/l

Sulfates (Total as SO_4)	250 mg/l (30-day arithmetic average)
Temperature	Eighty-five degrees Fahrenheit [29.44 degrees Celsius]. The maximum increase shall not be greater than five degrees Fahrenheit [2.78 degrees Celsius] above natural background conditions.
Combined radium 226 and radium 228 (Total)	5 pCi/l (30-day arithmetic average)
Gross alpha particle activity, including radium 226, but excluding radon and uranium	15 pCi/l (30-day arithmetic average)

[1] CAS No. is the chemical abstract service registry number. The registry database contains records for specific substances identified by the chemical abstract service.

[2] The standard for nitrates (N) is intended as an interim guideline limit. Since each stream or lake has unique characteristics which determine the concentration of this constituent that will cause excessive plant growth (eutrophication), the department reserves the right to review this standard after additional study and to set specific limitations on any waters of the state. However, in no case shall the concentration for nitrate plus nitrite N exceed 10 mg/l for any waters used as a municipal or domestic drinking water supply.

[3] Where the E. coli criteria are exceeded and there are natural sources, the criteria may be considered attained, provided there is reasonable basis for concluding that the indicator bacteria density attributable to anthropogenic sources is consistent with the level of water quality required by the criteria. This may be the situation, for example, in headwater streams that are minimally affected by anthropogenic activities.

TABLE 1

MAXIMUM LIMITS FOR SUBSTANCES IN OR
CHARACTERISTICS OF CLASS I, IA, II & III STREAMS

CAS[1] No.	Substance or Characteristic (a = Aquatic Life) (b = Municipal & domestic drinking water) (c = agricultural, irrigation, industrial) (d= Recreation)	Maximum Limit
7429905	Aluminum (a)	**Acute:** 750 µg/l
		Chronic: 87 µg/l Where the pH is equal to or greater than 7.0, and the hardness is equal to or greater than 50 mg/l as $CaCO_3$ in the receiving water after mixing, the 87 ug/l chronic total recoverable aluminum criterion will not apply, and aluminum will be regulated based on compliance with the 750 µg/l acute total recoverable aluminum criterion.
7446-41-7	Ammonia (Total as N) (a)	**Acute:** The one-hour average concentration of total ammonia (expressed as N in mg/l) does not exceed, more often than once every three years on the average, the numerical value given by the following formula: $$\frac{0.411}{1+10^{7.204-pH}}+\frac{58.4}{1+10^{pH-7.204}}$$ where salmonids are absent; or $$\frac{0.275}{1+10^{7.204-pH}}+\frac{39.0}{1+10^{pH-7.204}}$$ where salmonids are present.
		Chronic: The 30-day average concentration of total ammonia (expressed as N in mg/l) does not exceed, more often than once every three years on the average, the numerical value given by the following formula; and the highest 4-day average concentration of total ammonia within the 30-day averaging period does not exceed 2.5 times the numerical value given by the following formula:

		$(CV)\left(\frac{0.0577}{1+10^{7.688-pH}}\right)+\left(\frac{2.487}{1+10^{pH-7.688}}\right.$ Where (*CV*) = 2.85 when Temperature (T) is ≤ 14°C: or where: (*CV*) = 1.45 [QUOTE /], when T > 14°C
		Site-Specific Chronic: The following site-specific chronic standard applies to the Red River of the North beginning at the 12th Avenue North bridge in Fargo, North Dakota, and extending approximately 32 miles downstream to its confluence with the Buffalo River, Minnesota. This site-specific standard applies only during the months of October, November, December, January, and February. During the months of March through September, the statewide chronic ammonia standard applies. The 30-day average concentration of total ammonia (expressed as N in mg/l) does not exceed, more often than once every three years on the average, the numerical value given by the following formula; and the highest 4-day average concentration of total ammonia within the 30-day averaging period does not exceed 2.5 times the numerical value given by the following formula: $(CV)\left(\frac{0.0577}{1+10^{7.688-pH}}\right)+\left(\frac{2.487}{1+10^{pH-}\right.$ Where (*CV*) = 4.63 when Temperature (T) is ≤ 7°C: or Where (*CV*) = 1.45 [QUOTE /], when T > 7°C
7440-39-3	Barium (Total) (b)	1.0 mg/l (one-day arithmetic average)
7440-42-8	Boron (Total) (c)	0.75 mg/l (30-day arithmetic average)
16887-00-6	Chloride (Total) (a, c)	**Class I:** 100 mg/l (30-day arithmetic average)
		Class IA: 175 mg/l (30-day arithmetic average)
		Class II and Class III: 250 mg/l (30-day arithmetic average)
7782-50-5	Chlorine Residual (Total) (a)	**Acute:** 0.019 mg/l
		Chronic: 0.011 mg/l
7782-44-7	Dissolved oxygen (a)	5 mg/l as a daily minimum (up to 10% of representative samples collected during any 3-year period may be less than this value provided that lethal conditions are avoided)
14797-55-8	Nitrate as N^2 (a, b)	1.0 mg/l (up to 10% of samples may exceed)

14797-65-0	Nitrite as N (b)	1.0 mg/l
	E. Coli[3] (d)	Not to exceed 126 organisms per 100 ml as a geometric mean of representative samples collected during any 30-day consecutive period, nor shall more than 10 percent of samples collected during any 30-day consecutive period individually exceed 409 organisms per 100 ml. For assessment purposes, the 30-day consecutive period shall follow the calendar month. This standard shall apply only during the recreation season May 1 to September 30.
	pH (a)	**Class I and IA:** 7.0-9.0 (up to 10% of representative samples collected during any three-year period may exceed this range, provided that lethal conditions are avoided)
		Class II and Class III: 6.0-9.0 (up to 10% of representative samples collected during any three-year period may exceed this range, provided that lethal conditions are avoided)
108-95-2	Phenols (Total) (b)	0.3 mg/l (organoleptic criterion) (one-day arithmetic average)
7440-23-5	Sodium (b)	**Class 1:** 50 percent of total cations as mEq/l
		Class 1A, II and III: and 50 percent of total cations as mEq/l
18785-72-3	Sulfate (Total SO_4) (b)	**Class I:** 250 mg/l (30-day arithmetic average)
		Class1A and II: 450 mg/l (30-day arithmetic average)
		Class III: 750 mg/l (30-day arithmetic average)
	Sulfate (Total SO_4) (a)	**Site Specific:** 750 mg/l (Maximum) applies to the Sheyenne River from its headwaters to one-tenth mile downstream from Baldhill Dam. **131.10(b) requirement:** The water quality standards for the Red River and the portions of the Sheyenne River located downstream from the segment of the Sheyenne River to which the site-specific sulfate standard applies must continue to be maintained. The Sheyenne River from 0.1 mile downstream from Baldhill Dam to the confluence with the Red River shall not exceed 450 mg/l sulfate (total) 30-day arithmetic average and the Red River shall not exceed 250 mg/l sulfate (total 30-day arithmetic average after mixing, downstream from the confluence of the Sheyenne River. Regulated pollution control efforts must be developed to achieve compliance with these water quality standards.
	Temperature (a)	Eighty-five degrees Fahrenheit [29.44 degrees Celsius]. The maximum increase shall not be greater than five degrees Fahrenheit [2.78 degrees Celsius]

		above natural background conditions.
	Combined radium 226 and radium 228 (Total) (b)	5 pCi/l (30-day arithmetic average)
	Gross alpha particle activity, including radium 226, but excluding radon and uranium (b)	15 pCi/l (30-day arithmetic average)

[1] CAS No. is the chemical abstract service registry number. The registry database contains records for specific substances identified by the chemical abstract service.

[2] The standard for nitrates (N) is intended as an interim guideline limit. Since each stream or lake has unique characteristics which determine the concentration of this constituent that will cause excessive plant growth (eutrophication), the department reserves the right to review this standard after additional study and to set specific limitations on any waters of the state. However, in no case shall the concentration for nitrate plus nitrite N exceed 10 mg/l for any waters used as a municipal or domestic drinking water supply.

[3] Where the E. coli criteria are exceeded and there are natural sources, the criteria may be considered attained, provided there is reasonable basis for concluding that the indicator bacteria density attributable to anthropogenic sources is consistent with the level of water quality required by the criteria. This may be the situation, for example, in headwater streams that are minimally affected by anthropogenic activities.

~~TABLE 2~~

~~WATER QUALITY CRITERIA[1] (MICROGRAMS PER LITER)~~

		~~Aquatic Life Value Classes I, IA, II, III~~		~~Human Health Value~~	
~~CAS No.~~	~~Pollutant~~	~~Acute~~	~~Chronic~~	~~Classes I, IA, II[2]~~	~~Class III[2]~~
~~83-32-9~~	~~Acenaphthene~~			~~670~~	~~990~~
~~107-02-8~~	~~Acrolein~~	~~3.0~~	~~3.0~~	~~6~~	~~9~~
~~107-13-1~~	~~Acrylonitrile[4]~~			~~0.051~~	~~0.25~~
~~71-43-2~~	~~Benzene[4]~~			~~2.2~~	~~51~~
~~92-87-5~~	~~Benzidine[4]~~			~~0.000086~~	~~0.00020~~
~~63-25-2~~	~~Carbaryl (1-naphthyl-N-methycarbamate)~~	~~2.1~~	~~2.1~~		

56-23-5	Carbon tetrachloride[4] (Tetrachloromethane)			0.23	1.6
108-90-7	Chlorobenzene (Monochlorobenzene)			100[7]	1,600
2921-88-2	Chlorpyrifos	0.083	0.041		
120-82-1	1,2,4-Trichlorobenzene			35	70
118-74-1	Hexachlorobenzene[4]			0.00028	0.00029
107-06-2	1,2-Dichloroethane[4]			0.38	37
71-55-6	1,1,1-Trichloroethane			200[7]	
67-72-1	Hexachloroethane[4]			1.4	3.3
79-00-5	1,1,2-Trichloroethane[4]			0.59	16
79-34-5	1,1,2,2-Tetrachloroethane[4]			0.17	4.0
111-44-4	Bis(2-chloroethyl) ether[4]			0.030	0.53
91-58-7	2-Chloronaphthalene			1,000	1,600
88-06-2	2,4,6-Trichlorophenol[5]			1.4	2.4
59-50-7	p-Chloro-m-cresol (4-Chloro-3-methylphenol)			3000	
67-66-3	Chloroform (HM)[4] (Trichloromethane)			5.7	470
95-57-8	2-Chlorophenol			81	150
95-50-1	1,2-Dichlorobenzene[7]			420	1,300
541-73-1	1,3-Dichlorobenzene			320	960
106-46-7	1,4-Dichlorobenzene[7]			63	190
91-94-1	3,3'-Dichlorobenzidine[6]			0.021	0.028
75-35-4	1,1-Dichloroethylene[4]			7[7]	7,100
156-60-5	1,2-trans-Dichloroethylene[7]			100[7]	10,000
120-83-2	2,4-Dichlorophenol			77	290
542-75-6	1,3-Dichloropropylene (1,3-Dichloropropene) (cis and trans isomers)			0.34	21
78-87-5	1,2-Dichloropropane			0.50	15
105-67-9	2,4-Dimethylphenol			380	850

		Aquatic Life Value Classes I, IA, II, III		Human Health Value	
CAS No.	Pollutant	Acute	Chronic	Classes I, IA, II[8]	Class III[8]
121-14-2	2,4-Dinitrotoluene[4]			0.11	3.4
122-66-7	1,2-Diphenylhydrazine[4]			0.036	0.20
100-41-4	Ethylbenzene[7]			530	2,100
206-44-0	Fluoranthene			130	140
108-60-1	Bis(2-chloroisopropyl) ether			1400	65,000
75-09-2	Methylene chloride (HM)[4] (Dichloromethane)			4.6	590
74-83-9	Methyl bromide (HM) (Bromomethane)			47	1,500

75-25-2	Bromoform (HM)[5] (Tribromomethane)			4.3	140
75-27-4	Dichlorobromomethane (HM)[5]			0.55	17
124-48-1	Chlorodibromomethane (HM)[5]			0.40	13
87-68-3	Hexachlorobutadiene[4]			0.44	18
77-47-4	Hexachlorocyclopentadiene			40	1,100
78-59-1	Isophorone[4]			35	960
98-95-3	Nitrobenzene			17	690
51-28-5	2,4-Dinitrophenol			69	5,300
534-52-1	4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)			13	280
62-75-9	N-Nitrosodimethylamine[4]			0.00069	3.0
86-30-6	N-Nitrosodiphenylamine[4]			3.3	6.0
621-64-7	N-Nitrosodi-n-propylamine[4]			0.005	0.51
87-86-5	Pentachlorophenol	19[6]	15[6]	0.27	3.0
108-95-2	Phenol			10,000	860,000
117-81-7	Bis(2-ethylhexyl)phthalate[4]			1.2	2.2
85-68-7	Butyl benzyl phthalate			1,500	1,900
84-74-2	Di-n-butyl phthalate			2,000	4,500
84-66-2	Diethyl phthalate			17,000	44,000
131-11-3	Dimethyl phthalate			270,000	1,100,000
56-55-3	Benzo(a)anthracene (PAH)[4] (1,2-Benzanthracene)			0.0038	0.018
50-32-8	Benzo(a)pyrene (PAH)[4] (3,4-Benzopyrene)			0.0038	0.018
205-99-2	Benzo(b)fluoranthene (PAH)[4] (3,4-Benzofluoranthene)			0.0038	0.018
207-08-9	Benzo(k)fluoranthene (PAH)[4] (11,12-Benzofluoranthene)			0.0038	0.018
218-01-9	Chrysene (PAH)[4]			0.0038	0.018
120-12-7	Anthracene (PAH)[5]			8,300	40,000
86-73-7	Fluorene (PAH)[5]			1,100	5,300
53-70-3	Dibenzo(a,h)anthracene (PAH)[4] (1,2,5,6-Dibenzanthracene)			0.0038	0.018
193-39-5	Indeno(1,2,3-cd)pyrene (PAH)[4]			0.0038	0.018
129-00-0	Pyrene (PAH)[5]			830	4,000

		Aquatic Life Value Classes I, IA, II, III		Human Health Value	
CAS No.	Pollutant	Acute	Chronic	Classes I, IA, II[8]	Class III[9]
127-18-4	Tetrachloroethylene[4]			0.69	3.3
108-88-3	Toluene			1,000[7]	15,000
79-01-6	Trichloroethylene[4]			2.5	30
75-01-4	Vinyl chloride[4] (Chloroethylene)			0.025	2.4

309-00-2	Aldrin[4]	1.5		0.000049	0.000050
60-57-1	Dieldrin[4]	0.24	0.056	0.000052	0.000054
57-74-9	Chlordane[4]	1.2	0.0043	0.00080	0.00081
50-29-3	4,4'-DDT[4]	0.55[12]	0.001[12]	0.00022	0.00022
75-55-9	4,4'-DDE[4]			0.00022	0.00022
72-54-8	4,4'-DDD[4]			0.00031	0.00031
959-98-8	alpha-Endosulfan	0.11[11]	0.056[11]	62	89
33213-65-9	beta-Endosulfan	0.11[11]	0.056[11]	62	89
1031-07-8	Endosulfan sulfate			62	89
72-20-8	Endrin	0.09	0.036	0.059	0.060
7421-93-4	Endrin aldehyde			0.29	0.30
76-44-8	Heptachlor[4]	0.26	0.0038	0.000079	0.000079
1024-57-3	Heptachlor epoxide[4]	0.26	0.0038	0.000039	0.000039
319-84-6	alpha-BHC[4] (Hexachlorocyclohexane-alpha)			0.0026	0.0049
319-85-7	beta-BHC[4] (Hexachlorocyclohexane-beta)			0.0091	0.017
58-89-9	gamma-BHC (Lindane)[4] (Hexachlorocyclohexane-gamma)	0.95		0.2[7]	1.8
319-86-8	delta-BHC[4] (Hexachlorocyclohexane-delta)				
53469-21-9	PCB-1242 (Arochlor 1242)[4]		0.014[10]	0.000064[10]	0.000064[10]
11097-69-1	PCB-1254 (Arochlor 1254)[4]		0.014[10]	0.000064[10]	0.000064[10]
11104-28-2	PCB-1221 (Arochlor 1221)[4]		0.014[10]	0.000064[10]	0.000064[10]
11141-16-5	PCB-1232 (Arochlor 1232)[4]		0.014[10]	0.000064[10]	0.000064[10]
12672-29-6	PCB-1248 (Arochlor 1248)[4]		0.014[10]	0.000064[10]	0.000064[10]
11096-82-5	PCB-1260 (Arochlor 1260)[4]		0.014[10]	0.000064[10]	0.000064[10]
12674-11-2	PCB-1016 (Arochlor 1016)[4]		0.014[10]	0.000064[10]	0.000064[10]
8001-35-2	Toxaphene[4]	0.73	0.0002	0.00028	0.00028
7440-36-0	Antimony			5.6	640
7440-38-2	Arsenic[7]	340[9]	150[9]	10[7]	
1332-21-4	Asbestos[4,7]			7,000,000 fl	700
7440-41-7	Beryllium[4]			4[7]	
7440-43-9	Cadmium	2.1[8,15]	0.27[8,15]	5[7]	
16065-83-1	Chromium (III)	1800[8,15]	86[8,15]	100(total)[7]	
18540-29-9	Chromium (VI)	16	11	100(total)[7]	
7440-50-8	Copper	14.0[8,15]	9.3[8,15]	1000	
57-12-5	Cyanide (total)	22	5.2	140	140

		Aquatic Life Value Classes I, IA, II, III		Human Health Value	
CAS No.	Pollutant	Acute	Chronic	Classes I, IA, II[2]	Class III[3]
7439-92-1	Lead	82[8]	3.2[8]	15[7]	

7439-97-6	Mercury	1.7	0.012	0.050	0.051
7440-02-0	Nickel	470[6,15]	52[6,15]	100[7]	4,200
7782-49-2	Selenium	20	5	50[7]	
7440-22-4	Silver	3.8[6,15]			
7440-28-0	Thallium			0.24	0.47
7440-66-6	Zinc	120[6,15]	120[6,15]	7,400	26,000
688-73-3	Tributyltin	0.46	0.072		
1746-01-6	Dioxin (2,3,7,8-TCDD)[4]			5.0E-9	5.1E-9
15972-60-8	Alachlor			2[7]	
1912-24-9	Atrazine			3[8]	
56-38-2	Parathion	0.065	0.013		
1563-66-2	Carbofuran			40[7]	
94-75-7	2,4-D			70[7]	
75-99-0	Dalapon			200[7]	
103-23-1	Di(2-ethylhexyl)adipate			400[7]	
333-41-5	Diazinon	0.17	0.17		
84852-15-3	Nonylphenol (isomer mixture)[13]	28	6.6		
67708-83-2	Dibromochloropropane			0.2[7]	
156-59-2	Dichloroethylene (cis-1,2-)			70[7]	
88-85-7	Dinoseb			7[7]	
85-00-7	Diquat			20[8]	
145-73-3	Endothall			100[7]	
106-93-4	Ethylene dibromide (EDB)			0.05[7]	
1071-83-6	Glyphosate			700[7]	
72-43-5	Methoxychlor			40[7]	
23135-22-0	Oxamyl (Vydate)			200[7]	
1918-02-1	Picloram			500[7]	
122-34-9	Simazine			4[8]	
100-42-5	Styrene			100[7]	
1330-20-7	Xylenes			10,000[7]	
7782-41-4	Fluoride			4,000[7]	
14797-65-0	Nitrite			1,000[7]	
12587-47-2	Beta/photon emitters			4 mrem/yr[9]	
7440-61-1	Uranium			30[7]	
15541-45-4	Bromate			10[7]	
14998-27-7	Chlorite			1,000[7]	
	Haloacetic acids[14]			60[7]	

TABLE 2

WATER QUALITY CRITERIA[1] (MICROGRAMS PER LITER)

		Aquatic Life Value Classes I, IA, II, III		Human Health Value	
CAS No.	Pollutant (Compounds)	Acute	Chronic	Classes I, IA, II[2]	Class III[3]
71-55-6	1,1,1-Trichloroethane			~~200~~ 10,000[7]	200,000
79-00-5	1,1,2-Trichloroethane[4]			~~0.59~~ 0.55	~~16~~ 8.9
79-34-5	1,1,2,2-Tetrachloroethane[4]			~~0.17~~ 0.2	~~4~~ 3
75-35-4	1,1-Dichloroethylene[4]			~~7~~ 300	~~7,100~~ 20,000
156-60-5	1,2-trans-Dichloroethylene[7]			100	~~10,000~~ 4,000
120-82-1	1,2,4-Trichlorobenzene			~~35~~ 0.071	~~70~~ 0.076
95-50-1	1,2-Dichlorobenzene[7]			~~420~~ 1,000	~~1,300~~ 3,000
541-73-1	1,3-Dichlorobenzene			~~320~~ 7	~~960~~ 10
106-46-7	1,4-Dichlorobenzene[7]			~~63~~ 300	~~190~~ 900
107-06-2	1,2-Dichloroethane[4]			~~0.38~~ 9.9	~~37~~ 650
78-87-5	1,2-Dichloropropane			~~0.50~~ 0.90	~~15~~ 31
542-75-6	1,3-Dichloropropylene (1,3-Dichloropropene)			~~0.34~~ 0.27	~~21~~ 12
122-66-7	1,2-Diphenylhydrazine[4]			~~0.036~~ 0.03	0.20
121-14-2	2,4-Dinitrotoluene[4]			~~0.11~~ 0.049	~~3.4~~ 1.7
95-57-8	2-Chlorophenol			~~81~~ 30	~~150~~ 800
120-83-2	2,4-Dichlorophenol			~~77~~ 10	~~290~~ 60
88-06-2	2,4,6-Trichlorophenol[4]			~~1.4~~ 1.5	~~2.4~~ 2.8
91-58-7	2-Chloronaphthalene			~~1,000~~ 800	~~1,600~~ 1,000
91-94-1	3,3'-Dichlorobenzidine[4]			~~0.021~~ 0.049	~~0.028~~ 0.15
105-67-9	2,4-Dimethylphenol			~~380~~ 100	~~850~~ 3,000
51-28-5	2,4-Dinitrophenol			~~69~~ 10	~~5,300~~ 300
94-75-7	2,4-D			~~70~~[7] 1,300	12,000
72-54-8	4,4'-DDD[4]			~~0.00031~~ 0.00012	~~0.00031~~ 0.00012

75-55-9	4,4'-DDE[4]			~~0.00022~~ 0.000018	~~0.00022~~ 0.000018
50-29-3	4,4'-DDT[4]	0.5512	0.00112	~~0.00022~~ 0.000030	~~0.00022~~ 0.000030
534-52-1	4,6-Dino-o-cresol (4,6-Dinitro-2-methylphenol)			13	280
83-32-9	Acenaphthene			~~670~~ 70	~~990~~ 90
107-02-8	Acrolein	3	3	~~6~~ 3	~~9~~ 400
107-13-1	Acrylonitrile[4]			~~0.051~~ 0.061	~~0.25~~ 7.0
15972-60-8	Alachlor			2[7]	
309-00-2	Aldrin[4]	1.5		~~0.000049~~ 7.7E-7	~~0.000050~~ 7.7E-7
319-84-6	alpha-BHC4 (Hexachlorocyclohexane-alpha)			~~0.0026~~ 0.00036	~~0.0049~~ 0.00039
319-85-7	beta-BHC4 (Hexachlorocyclohexane-beta)			~~0.0091~~ 0.008	~~0.017~~ 0.014
58-89-9	gamma-BHC (Lindane)[4] (Hexachlorocyclohexane-gamma)	0.95		0.2[7]	~~1.8~~ 4.4
959-98-8	alpha-Endosulfan	0.11[11]	0.056[11]	~~62~~ 20	~~89~~ 30
33213-65-9	beta-Endosulfan	0.11[11]	0.056[11]	~~62~~ 20	~~89~~ 40
120-12-7	Anthracene (PAH)[5]			~~8,300~~ 300	~~40,000~~ 400
1332-21-4	Asbestos[4 7]			7,000,000 f/l	7,000,000 f/l
1912-24-9	Atrazine			3[7]	
71-43-2	Benzene[4]			~~2.2~~ 2.1	~~51~~ 58
92-87-5	Benzidine[4]			~~0.000086~~ 0.0014	~~0.00020~~ 0.011
56-55-3	Benzo(a)anthracene (PAH)4 (1,2-Benzanthracene)			~~0.0038~~ 0.0012	~~0.018~~ 0.0013
50-32-8	Benzo(a)pyrene (PAH)4 (3,4-Benzopyrene)			~~0.0038~~ 0.00012	~~0.018~~ 0.00013
205-99-2	Benzo(b)fluoranthene (PAH)4 (3,4-Benzofluoranthene)			~~0.0038~~ 0.0012	~~0.018~~ 0.0013
207-08-9	Benzo(k)fluoranthene (PAH)4 (11,12-Benzofluoranthene)			~~0.0038~~ 0.012	~~0.018~~ 0.013
12587-47-2	Beta/photon emitters			4 mrem/yr[7]	
111-44-4	Bis(2-chloroethyl) ether[4]			0.030	~~0.53~~ 2.2
108-60-1	Bis(2-chloro -1-Methylethyl ~~isopropyl~~) ether			~~1400~~ 200	~~65,000~~ 4,000

117-81-7	Bis(2-ethylhexyl)phthalate[4]			~~1.2~~ 0.32	~~2.2~~ 0.37
15541-45-4	Bromate			10[7]	
75-25-2	Bromoform (HM)[5] (Tribromomethane)			~~4.3~~ 7.0	~~140~~ 120
85-68-7	Butyl benzyl phthalate			~~1,500~~ 0.10	~~1,900~~ 0.10
63-25-2	Carbaryl (1-naphthyl-N-methycarbamate)	2.1	2.1		
1563-66-2	Carbofuran			40[7]	
56-23-5	Carbon tetrachloride4 (Tetrachloromethane)			~~0.23~~ 0.40	~~1.6~~ 5
57-74-9	Chlordane[4]	1.2	0.0043	~~0.00080~~ 0.00031	~~0.00081~~ 0.00032
14998-27-7	Chlorite			1,000[7]	
108-90-7	Chlorobenzene (Monochlorobenzene)			100[7]	~~1,600~~
124-48-1	Chlorodibromomethane (HM)[5]			~~0.40~~ 0.80	~~13~~ 21
67-66-3	Chloroform (HM)4 (Trichloromethane)			~~5.7~~ 60	~~470~~ 2,000
2921-88-2	Chlorpyrifos	0.083	0.041		
218-01-9	Chrysene (PAH)[4]			~~0.0038~~ 0.12	~~0.018~~ 0.13
57-12-5	Cyanide (total)	22	5.2	~~140~~ 4	~~140~~ 400
75-99-0	Dalapon			200[7]	
103-23-1	Di(2-ethylhexyl)adipate			400[7]	
333-41-5	Diazinon	0.17	0.17		
53-70-3	Dibenzo(a,h)anthracene (PAH)4 (1,2,5,6-Dibenzanthracene)			~~0.0038~~ 0.00012	~~0.018~~ 0.00013
67708-83-2	Dibromochloropropane			0.2[7]	
75-27-4	Dichlorobromomethane (HM)[5]			~~0.55~~ 0.95	~~17~~ 27
156-59-2	Dichloroethylene (cis-1,2-)			70[7]	
60-57-1	Dieldrin[4]	0.24	0.056	~~0.000052~~ 1.2E-6	~~0.000054~~ 1.2E-6
84-66-2	Diethyl phthalate			~~17,000~~ 600	~~44,000~~ 600
131-11-3	Dimethyl phthalate			~~270,000~~ 2,000	~~1,100,000~~ 2,000

84-74-2	Di-n-butyl phthalate			~~2,000~~ 20	~~4,500~~ 30
88-85-7	Dinoseb			7[7]	
1746-01-6	Dioxin (2,3,7,8-TCDD)[4]			5.00E-09	5.10E-09
~~85-00-7~~ 2764-72-9	Diquat			20[7]	
1031-07-8	Endosulfan sulfate			~~62~~ 20	~~89~~ 40
145-73-3	Endothall			100[7]	
72-20-8	Endrin	0.09	0.036	~~0.059~~ 0.03	~~0.060~~ 0.03
7421-93-4	Endrin aldehyde			~~0.29~~ 1	~~0.30~~ 1
100-41-4	Ethylbenzene[7]			~~530~~ 68	~~2,100~~ 130
106-93-4	Ethylene dibromide (EDB)			0.05[7]	
206-44-0	Fluoranthene			~~130~~ 20	~~140~~ 20
86-73-7	Fluorene (PAH)5			~~1,100~~ 50	~~5,300~~ 70
1071-83-6	Glyphosate			700[7]	
	Halocetic acids[14]			60[7]	
1024-57-3	Heptachlor epoxide4	0.26	0.0038	~~0.000039~~ 0.000032	~~0.000039~~ 0.000032
76-44-8	Heptachlor[4]	0.26	0.0038	~~0.000079~~ 0.0000059	~~0.000079~~ 0.0000059
118-74-1	Hexachlorobenzene[4]			~~0.00028~~ 0.000079	~~0.00029~~ 0.000079
87-68-3	Hexachlorobutadiene[4]			~~0.44~~ 0.01	~~18~~ 0.01
77-47-4	Hexachlorocyclopentadiene			~~40~~ 4	~~1,100~~ 4
67-72-1	Hexachloroethane[4]			~~1.4~~ 0.10	~~3.3~~ 0.10
193-39-5	Indeno (1,2,3-cd) pyrene (PAH)[4]			~~0.0038~~ 0.0012	~~0.018~~ 0.0013
78-59-1	Isophorone[4]			~~35~~ 34	~~960~~ 1,800
72-43-5	Methoxychlor			~~40~~[7] 0.02	0.02
74-83-9	Methyl bromide (HM) (Bromomethane)			~~47~~ 100	~~1,500~~ 10,000
75-09-2	Methylene chloride (HM)4 (Dichloromethane)			~~4.6~~ 20	~~590~~ 1,000

98-95-3	Nitrobenzene			~~17~~ 10	~~690~~ 600
62-75-9	N-Nitrosodimethylamine[4]			0.00069	3
621-64-7	N-Nitrosodi-n-propylamine[4]			0.005	0.51
86-30-6	N-Nitrosodiphenylamine[4]			3.3	6
84852-15-3	Nonylphenol (isomer mixture)[13]	28	6.6		
23135-22-0	Oxamyl (Vydate)			200[7]	
56-38-2	Parathion	0.065	0.013		
53469-21-9	PCB 1242 (Arochlor 1242)[4]		0.014[11]	0.000064[11]	0.000064[11]
2674-11-2	PCB-1016 (Arochlor 1016)[4]		0.014[11]	0.000064[11]	0.000064[11]
11104-28-2	PCB-1221 (Arochlor 1221)[4]		0.014[11]	0.000064[11]	0.000064[11]
11141-16-5	PCB-1232 (Arochlor 1232)[4]		0.014[11]	0.000064[11]	0.000064[11]
12672-29-6	PCB-1248 (Arochlor 1248)[4]		0.014[11]	0.000064[11]	0.000064[11]
11097-69-1	PCB-1254 (Arochlor 1254)[4]		0.014[11]	0.000064[11]	0.000064[11]
11096-82-5	PCB-1260 (Arochlor 1260)[4]		0.014[11]	0.000064[11]	0.000064[11]
59-50-7	p-Chloro-m-cresol (4-chloro-3-methylphenol)			~~3,000~~ 500	2,000
87-86-5	Pentachlorophenol	19[8]	15[8]	~~0.27~~ 0.03	~~3~~ 0.04
108-95-2	Phenol			~~10,000~~ 4,000	~~860,000~~ 300,000
1918-02-1	Picloram			500[7]	
129-00-0	Pyrene (PAH)[5]			~~830~~ 20	~~4,000~~ 30
122-34-9	Simazine			4[7]	
100-42-5	Styrene			100[7]	
127-18-4	Tetrachloroethylene[4]			~~0.69~~ 10	~~3.3~~ 29
108-88-3	Toluene			~~1,000~~[7] 57	~~15,000~~ 520
8001-35-2	Toxaphene[4]	0.73	0.0002	~~0.00028~~ 0.0007	~~0.00028~~ 0.00071
688-73-3	Tributyltin	0.46	0.072		

79-01-6	Trichloroethylene[4]			~~2.5~~ 0.60	~~30~~ 7
75-01-4	Vinyl chloride4 (Cloroethylene)			~~0.025~~ 0.022	~~2.4~~ 1.6
1330-20-7	Xylenes			10,000[7]	
		Aquatic Life Value Classes I, IA, II, III		Human Health Value	
CAS No.	Pollutant (Elements)	Acute	Chronic	Classes I, IA, II[2]	Class III[3]
7440-36-0	Antimony			5.6	640
7440-38-2	Arsenic[7]	340[9]	150[9]	10[7]	
7440-41-7	Beryllium[4]			4[7]	
7440-43-9	Cadmium	~~2.1~~[6,15] 1.8[6,15]	~~0.27~~[6,15] 0.72[6,15]	5[7]	
16065-83-1	Chromium (III)	1800[6,15]	86[6,15]	100(total)[7]	
18540-29-9	Chromium (VI)	16	11	100(total)[7]	
7440-50-8	Copper	14.0[6,15]	9.3[6,15]	1000	
7782-41-4	Fluoride			4,000[7]	
7439-92-1	Lead	82[6]	3.2[6]	15[7]	
7439-97-6	Mercury	1.7	0.012	0.050	0.051
7440-02-0	Nickel	470[6,15]	52[6,15]	100[7]	4,200
7782-49-2	Selenium	20	5	50[7]	
7440-22-4	Silver	3.8[6,15]			
7440-28-0	Thallium			0.24	0.47
7440-61-1	Uranium			30[7]	
7440-66-6	Zinc	120[6,15]	120[6,15]	7,400	26,000

APPENDIX II

LAKE AND RESERVOIR CLASSIFICATION

Lakes and reservoirs are classified according to the water characteristics which are to be maintained in the specified lakes and reservoirs. The beneficial water uses and parameter limitations designated for Class I streams shall apply to all classified lakes and reservoirs. For lakes and other waterbodies not listed, the following default classification applies: Class 4.

BACKGROUND DISCUSSION

Background

The 1972 Clean Water Act states that the State shall from time to time, but at least once every 3 years, hold public hearings for the purpose of reviewing applicable water quality standards adopted pursuant to §131.10 through 131.15 and Federally promulgated water quality standards and, as appropriate, modifying and adopting standards. The State shall also re-examine any waterbody segment with water quality standards that do not include the uses specified in section 101(a)(2) of the Act every 3 years to determine if any new information has become available. If such new information indicates that the uses specified in section 101(a)(2) of the Act are attainable, the State shall revise its standards accordingly. Procedures States establish for identifying and reviewing water bodies for review should be incorporated into their Continuing Planning Process.

In addition, if a State does not adopt new or revised criteria for parameters for which Environmental Protection Agency (EPA) has published new or updated Clean Water Act (CWA) section 304(a) criteria recommendations, then the State shall provide an explanation when it submits the results of its triennial review to the Regional Administrator consistent with CWA section 303(c)(1) and the requirements of paragraph (c) of this section.

Water Quality Standard Criteria with Published New or Updated CWA Section 304(a) Criteria Recommendations.

1) Added Definitions For Nutrients and Eutrophication.

Defined the words nutrient and eutrophication used in the narrative nutrient criteria.

2) Added The Allowance Of Compliance Schedules.

On August 5, 2015, the EPA Administrator signed a final rule updating six key areas of the federal water quality standards regulation which helps implement the Clean Water Act. The final rule was published in the Federal Register on August 21, 2015 (80 FR 51019). The final revisions required that water quality standards authorize the use of schedules of compliance for water quality-based effluent limits (WQBELs) in NPDES permits. Since the state already has administrative rules for the authorization and implementation of schedules of compliance the additional authorization is a formality.

3) Added A New Narrative Standard For Nutrients.

The nutrient narrative standard is the result of a three-year collaborative effort by the North Dakota Nutrient Reduction Strategy Group (NDNRSG). This group is composed of over 80 individuals from two States, two Canadian Provinces and multiple groups representing a diverse set of interested including but not limited to farm agriculture, livestock, food safety, and industries such as manufactory, construction, energy, and lastly both state and federal governments. This diverse group is further broken into five work group: (1) Technical; (2) Nutrient Criteria Development, Prioritization, Loads, and Targets; (3) Agriculture and Other Nonpoint Sources; (4) Municipal and Industrial Point Sources; and (5) Education and Outreach.

This group is an outgrowth of the Nutrient Criteria Development Plan, which was released in May of 2007 and describes the anticipated conceptual approach for developing nutrient water quality criteria. Following the release of the Nutrient Criteria Development Plan and the Stoner Memo, initial discussions began on developing a state nutrient reduction strategy in late 2011. In 2012 the Planning Team was formed and through this initiative, a Nutrient Reduction Strategy was developed which included formation of a robust and comprehensive planning group.

In general the NDNRSG agreed that nutrient criteria were needed to protect our water resources and their beneficial uses, but that there are many reason why nutrient criteria have not been set. Nutrients are different that most water contaminants. Nutrient thresholds cannot be set as a one size fits all, like can be set for heavy metals or other toxins, because each waterbody has its own unique natural nutrient concentrations, which are predicated on a multitude of existing conditions including inflow, outflow, and soil characteristics. Given these variables, the group recognized that in order to develop defensible nutrient criteria require them to be based on local conditions and supported with sound science. To address the need to protect the state's water dependent beneficial uses, the group agreed to the development of a narrative standard that could be used to guide site and waterbody specific protection based on a eutrophic response to nutrients, primarily nitrogen and phosphorus.

4) **Under Numeric Standards (f), Added Wetlands, Isolated Ponds, Class 4 Lakes Not Already Listed in Appendix II, Sloughs, and Marshes.**

This is added to ensure that the appropriate criteria are applied to wetlands and temporary lakes that have grown out of wetlands, particularly the ones that developed into significant fisheries. Additionally the language accurately defines how the state has applies the standards.

5) **Redesigning Numeric Criteria TABLE 1, MAXIMUM FOR SUBSTANCES IN OR CHARACTERISTICS OF CLASS I, IA, II & III STREAMS.**

For improved understanding and ease of use, the layout of numeric criteria Table 1 was changed and the beneficial use being protected by the criteria added.

6) **Redesigning Numeric Criteria TABLE 2, WATER QUALITY CRITERIA (MICROGRAMS PER LITER)**

For improved understanding and ease of use, the numeric criteria Table 1 was reorganized into two sections (organic compounds and elements) and put into alphabetical order.

7) Ammonia: Actively being reviewed but not being proposed for adoption at this time.

The North Dakota Department of Health (NDDoH) is currently studying the most recently recommended ammonia criteria as outlined in the publication EPA 822-R-13-001 Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater, 2013 and its implication to the state and specific waters. The NDDoH has identified that implementing the new ammonia criteria poses substantial regulatory compliance challenges.

The regulatory compliance challenges are technical, social and economic. The technical difficulties surround understanding the complex science of ammonia, the probable effectiveness of alternative treatment options, and identifying the natural biological communities. The social and economic challenges are primarily though not limited to developing a workable strategy that combines the science with applicable and affordable options to achieve compliance for the smaller publically owned treatment works (POTWs).

There are two-hundred and fifty-eight (258) smaller public owned treatment works (POTW) in rural North Dakota. To put a face to these communities they are often isolated by 20 miles or more, range in population from 15 to 2411, and have a median population of 219. The average resident is 52-years old with greater than 30% over 65-years. The lack of population coupled with a large percentage of retirement age residence make any regulatory solution limited in both expertise and money.

The North Dakota Department of Health has an end responsibility to protect the waters of the state and the aquatic community that lives within it. To reach this end the department has an obligation to implement criteria that are protective and possibly to achieved. To address both the responsibility and the obligation the department is developing a list of strategy options to accompany the adoption of the ammonia criteria. Strategy options currently being explored include:

a. **Improved lagoon option:** The North Dakota Pollution Discharge Elimination System (NDPDES) is researching the literature for best management practices, and optimization methods for increasing ammonia conversion and removal efficiencies in facultative lagoon systems.
b. **Recalculating ammonia criteria:** Ammonia is based on its toxicity to a wide group of aquatic organism. The criteria are set to protect the most sensitive species. For aquatic systems that do not have these sensitive groups of organism it is permissible under federal rule to recalculate the ammonia criteria based on the sensitivity of the organisms that are actually and naturally present. The different criteria might be less stringent if the aquatic animals and age classes naturally present are less sensitive to ammonia. Specifically, if mussels and early life stages of fish are not present at all or during certain times of the year that would allow seasonal releases or a relaxation of the criteria. This looks promising in western North Dakota were preliminary data indicates a absence of mussels in certain streams with high sediment bed loads.
c. **Research advantages of better temperature and pH datasets for their receiving waters:** Ammonia toxicity varies depending temperature and pH. North Dakota's NDPDES permits are often based on limited or no actual temperature and pH data on the receiving water. The

collection of accurate, appropriately timed temperature and pH datasets from receiving streams at the outfall point will be potentially beneficial for writing ammonia permits that reflect the seasonal pH and temperature patterns. Table top exercises indicate that ammonia concentrations would be relaxed in fall, winter, and spring, compared to summer when early fish life stages are resent. If mussels are also naturally absent a major relaxation of the standard might be appropriate (see **2** above). Timing discharges based on pH and temperature within a select season would be a low-cost low-tech alternative to upgrading structure to a small aging community.

d. **Research outfall structures and distance options:** Research literature on the effectiveness of variable outfalls options to identify the effectiveness of grassed waterways or channels for ammonia removal and conversion. Contemplating a pilot study, on the ammonia reductions from POTWs that discharge into ephemeral washes or grassed waterway as a conduit to its receiving waters. If discharging through a length of grassed waterway within a select season (see **3** above) is found that at a measure flow for a measurable distance it too would be a low-cost low-tech alternative to upgrading structure to a small aging community.
e. **Include mixing-zones in NDPDES permits:** Presently, the department allows mixing zones, but as a general rule has not included them in POTWs general permits. Including mixing zones into general permits will require a better understanding of the science behind the appropriate mixing for ammonia into small low gradient streams. To be functional, the science will need to be understood well enough for the permit writer to have confidence that any permit developed will prevent toxic impacts on a case-by-case basis.
f. **Include compliance schedules in permits:** While a NDPDES permit may contain a schedule of compliance leading to the return of a permittee into compliance with federal and state regulation(s). The NDPDES will investigate if a more aggressive use of this option in conjunction with strategies **1-5** is appropriate.
g. **Study impact of short term intermittent discharges on mussel and sensitive fish species and life stages:** Many of the smaller POTWs in the state discharge only periodically (spring and fall) and for short duration (3 to 5 days). The NDDoH is researching the literature to see if these short duration discharges can be timed in such a way that the aquatic species and life stages at risk from elevated ammonia are not present.

8) Chemical Abstract Service Number Corrected for Diquat.

The Chemical Abstract Service assigns discrete numbers (CAS No.) to identify chemical substances described in the open scientific literature including compounds, elements, isotopes and alloys. While a CAS Number is not a requirement for the water quality standards it is useful to identify beyond any doubt the substance in the numeric criteria. These numbers periodically change and need to be updated. The CAS No. for Diquat is changed from 85-00-7 to 2764-72-9.

9) Removed The Organic Compound Delta-BHC (Hexachlorocyclone Hexane-Delta) From Table 2.

The organic compound delta-BHC (Hexachlorocyclone hexane-delta) CAS No. 319-86-8 has been part of the North Dakota's water quality standards without a numeric criteria assigned since 1991. Additionally, a search of U.S. Environmental Protection Agencies recommended numeric criteria did not find any recommend numeric criteria for this compound. Since there has never been a state promulgated or federally recommend numeric criteria for this compound it has been removed from Table 2.

10) Updated the hardness Based Cadmium Chronic and Acute Aquatic Life Criteria.

The NDDoH reviewed the U.S. Environmental Protection Agencies publication EPA 822-F-16-003, Aquatic Life Ambient Water Quality Criteria Update for Cadmium – 2016, and found the updated acute and chronic criteria appropriate for protecting the states beneficial uses.

11) Updated the Human Health Criteria for All Priority Pollutants and Select Nonpriority Pollutants.

In 2015 the U.S. Environmental Agency (EPA) revised 94 of the existing human health criteria to reflect the latest scientific information, including updated exposure factors (body weight, drinking water consumption rates, fish consumption rate), bioaccumulation factors, and toxicity factors (reference dose, cancer slope factor). The criteria have also been updated to follow the current EPA methodology for deriving human health criteria (USEPA 2000). EPA also developed chemical-specific science documents for each of the 94 chemical pollutants. The science documents detail the latest scientific information supporting the updated final human health criteria, particularly the updated toxicity and exposure input values.

North Dakota Department of Health (NDDoH) felt that protecting human health as vital and updated or made sure our current criteria matched the 2015 revised criteria for all priority pollutants and the select nonpriority pollutants Barium, Chlorophenoxy Herbicide (2-4-D), Methoxychlor, Nitrates, and pH. The select nonpriority pollutants addressed are included as they are appropriate for North Dakota.

12) Nonpriority Pollutants Human-Health Criteria Reviewed, But Not Adopted At This Time.

The NDDoH reviewed the revised Human-Health Criteria for adoption into the state water quality standards. North Dakota's water quality standards do not have a nonpriority pollutants option. Lacking such a designation makes each criteria in the standards self enforceable for the beneficial it is designed to support. Where appropriate the state has adopted the human-health criteria for nonpriority pollutants but uses its discretion not to adopt the nonpriority pollutants: 1,2,4,4-Tetrachlorobenzne, 4,4,5-Trichlorophenol, Bis(Chloromethyl) Ether, Chlorophenoxy Herbicide (2,4,5-TP or Silvex), Dinitrophenols, Hexachlorocyclohexane(HCH), Manganese, Nitrosamines, Nitrosodibutylamine, Nitrosodiebutylamine, Nitrosopyrrolidine, Pentachlorobenzne, and solids dissolve and Salinity at this time.